

# JICA's Cooperation for Quality Road Infrastructure



Kazuki YAMADA

Deputy Director of Team 1, Transportation Group, Infrastructure  
Management Department

# Outline of presentation

1. Outline of JICA's Approach and Vision
2. JICA Global Agenda, Transportation
3. Mainstreaming climate change measures
4. Climate change adaptation measures
  - ① The Project for Reconstruction of the Nippon Causeway
  - ② The Project for Avalanche Protection on Bishkek-Osh Road
  - ③ Resilient Mountains Road for Landslide Risk Mitigation

# We, JICA



## Mission

JICA, in accordance with the Development Cooperation Charter, will work on *human security*\* and *quality growth*.

## Vision

### Leading the world with trust

JICA, with its partners, will take the lead in forging bonds of trust across the world, aspiring for a free, peaceful and prosperous world where people can hope for a better future and explore their diverse potentials.

## Actions

1

### Commitment:

Commit ourselves with pride and passion to achieving our mission and vision.

2

### Gemba:

Dive into the field ("gemba") and work together with the people.

3

### Strategy:

Think and act strategically with broad and long-term perspectives.

4

### Co-creation:

Bring together diverse wisdom and resources.

5

### Innovation:

Innovate to bring about unprecedented impacts.

# Project Menu



## Technical Cooperation

- Technology and know-how cooperation through people.
- Dispatch experts and provide training in Japan to develop human resources and establish systems



## Official Development Assistance Grants

- Maintenance of roads and other infrastructure, procurement of medical supplies and equipment, etc.
- It provides development funds to countries with low income without imposing repayment obligations.



## Official Development Assistance Loans

- Large-scale infrastructure, such as the construction of long-distance roads
- Loans with low interest rate conditions to countries with certain income.

# JICA Global Agenda



## JICA Global Agenda (JGA)

JICA has set 20 JICA Global Agenda, that are cooperation strategies (20) for global issues to tackle complex development challenges such as healthcare, conflict and climate change.

### JICA GLOBAL AGENDA

— JICA'S 20 STRATEGIES FOR GLOBAL DEVELOPMENT ISSUES



Prosperity

People

Peace

Planet

1. Urban and Regional Development
2. Transportation
3. Energy and Mining
4. Private Sector Development
5. Agriculture and Rural Development
6. Health
7. Improving Nutrition
8. Education
9. Social Security/ Disability and Development
10. Sport and Development
11. Peacebuilding
12. Governance
13. Public Finance and Financial Systems
14. Gender Equality and Women's Empowerment
15. Digital for Development
16. Climate Change
17. Nature Conservation
18. Environmental Management
19. Sustainable Water Resources Management and Water Supply
20. Disaster Risk Reduction through Pre-disaster Investment and Build Back Better



# JICA Global Agenda : No2 Transportation

JICA Global Agenda

JICA's 20 Strategies  
for Global Development Issues

NO. 2

Transportation

## The world where all people and goods move safely and freely

Transportation and traffic are the driving factors to live culturally and creatively in human society.

While promoting low-carbon and decarbonization in transportation sector, JICA works on the development of transportation infrastructure, improvement of maintenance / management techniques and safety. We aim to create society where people can move freely and safely, and necessary goods can be transported anywhere in the world including the last one mile.



SUSTAINABLE  
DEVELOPMENT  
GOALS



Japan International Cooperation Agency (JICA) works toward the achievement of the Sustainable Development Goals (SDGs).

Cover Photo—Citizens celebrate the inauguration of Cambodia's first cable-stayed bridge, Tsubasa Bridge, which was built with Japanese assistance (Photo: Kyodo News)

# Mainstreaming climate change measures

Incorporating climate change measures into all development projects

At the project planning stage, JICA assesses the elements that contribute to climate change mitigation and adaptation in the project design.

### Climate Change Finance Impact Tool (JICA Climate-FIT) for Mitigation & Adaptation

In order to facilitate cooperation policy reviews and formation of projects to address climate change in developing countries, JICA Climate Finance Impact Tool (Climate-FIT) facilitates to estimate greenhouse gas emissions reductions, and assess climate change impacts and vulnerability, thereby mainstreaming climate change measures in the projects.

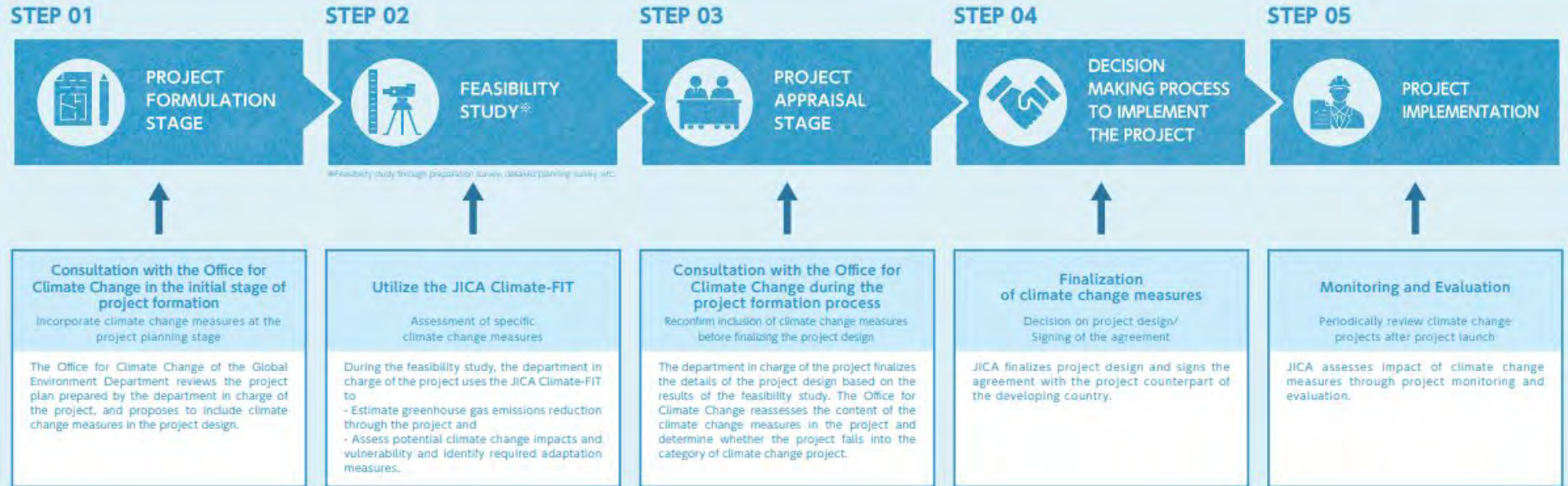
Scan the QR code below for more information on JICA Climate-FIT



Mitigation



Adaptation



# Climate Mitigation and Adaptation

There are two types of measures to deal with climate change: mitigation and adaptation



## Republic of Kiribati

- CASE 1 : Climate change measures in the road sector
- The Project for Reconstruction of the Nippon Causeway



# The Project for Reconstruction of the Nippon Causeway (ODA Grants)

## Project Overview

- The purpose is to carry out road and bridge repairs to address the deterioration of the only road (L=3,230m) connecting Betio Island, which has an international port, and Bairiki Island, where the administrative headquarters and residential areas are located.
- This project is expected to ensure smooth and safe traffic between Betio and Bairiki and reduce maintenance costs for the causeway.

## Damage situation

- Aging deterioration due to the passage of about 30 years since construction
- Partial damage and collapse of the road due to the impact of king tides (high tides) observed several times a year



Damage to revetments and roads caused by king tides



Damage to revetments (concrete mats)

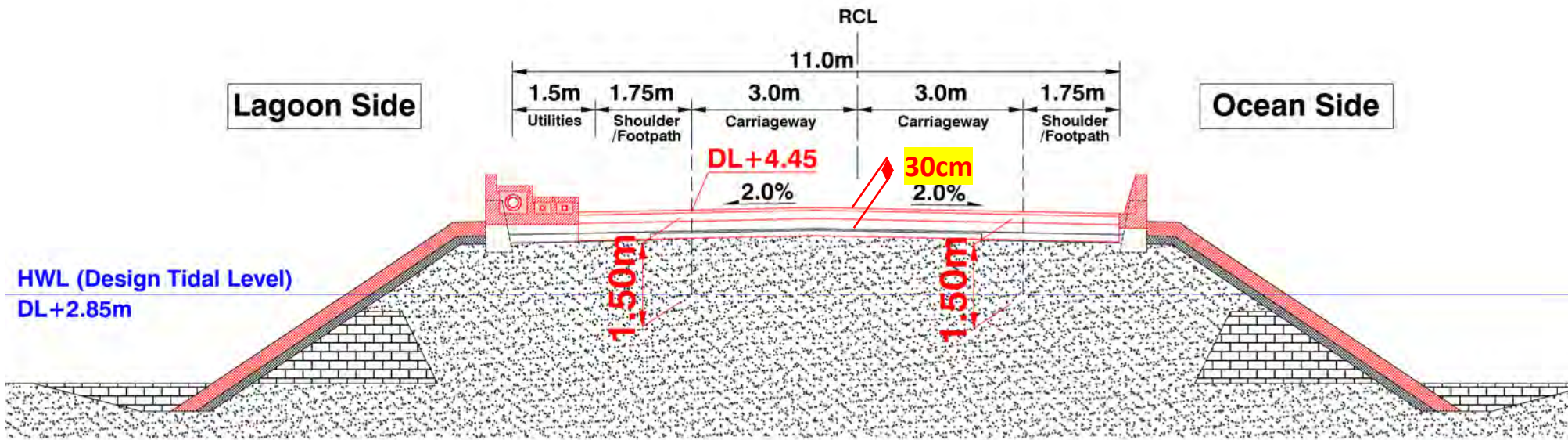


Waves overtopping roads caused by king tides

# The Project for Reconstruction of the Nippon Causeway (ODA Grants)

## Considering countermeasures

- Analyzing the average tide levels of king tides that occurred over the past 20 years (1995-2015) from tide observation data
- Taking into account the mean tide level of the king tides and future sea level rise due to climate change (IPCC 5th Assessment Report), the elevation will be raised to a position +1.5m above HWL (D (approximately 30cm above the current road surface level))



Sectional view of remodeled area

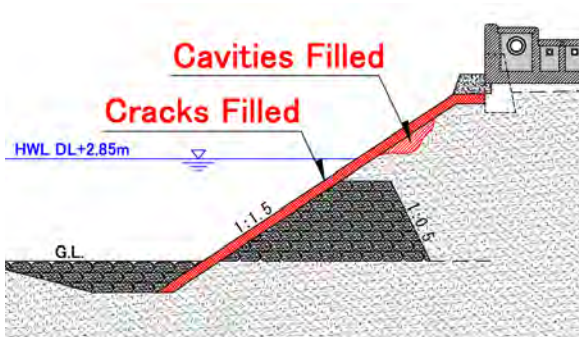
# The Project for Reconstruction of the Nippon Causeway (ODA Grants)

## Considering countermeasures

### -Reviewing revetment structure taking into account future sea level rise-

- Considering the mean tide level of the king tide and the IPCC 5th Assessment Report, the design wave height and overtopping volume are set for the ocean side and lagoon side.
- Based on the design wave height and overtopping volume, the revetment structure and wave breaker height were examined, and the following three types of revetment structure were applied for each area.

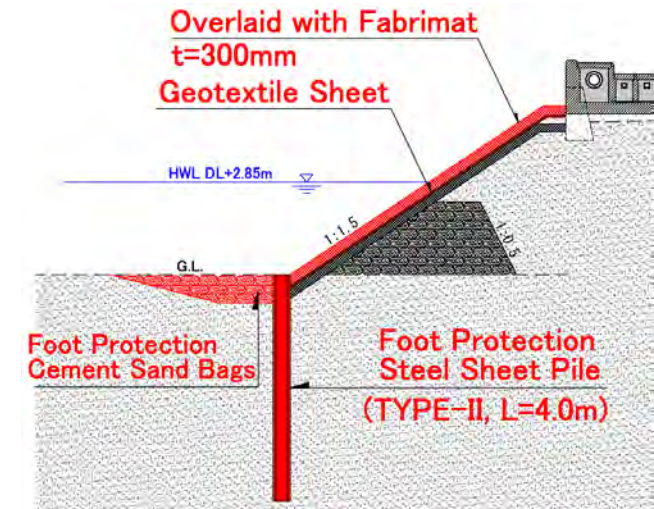
### Review of revetment structure



① : Repair of existing revetment mats

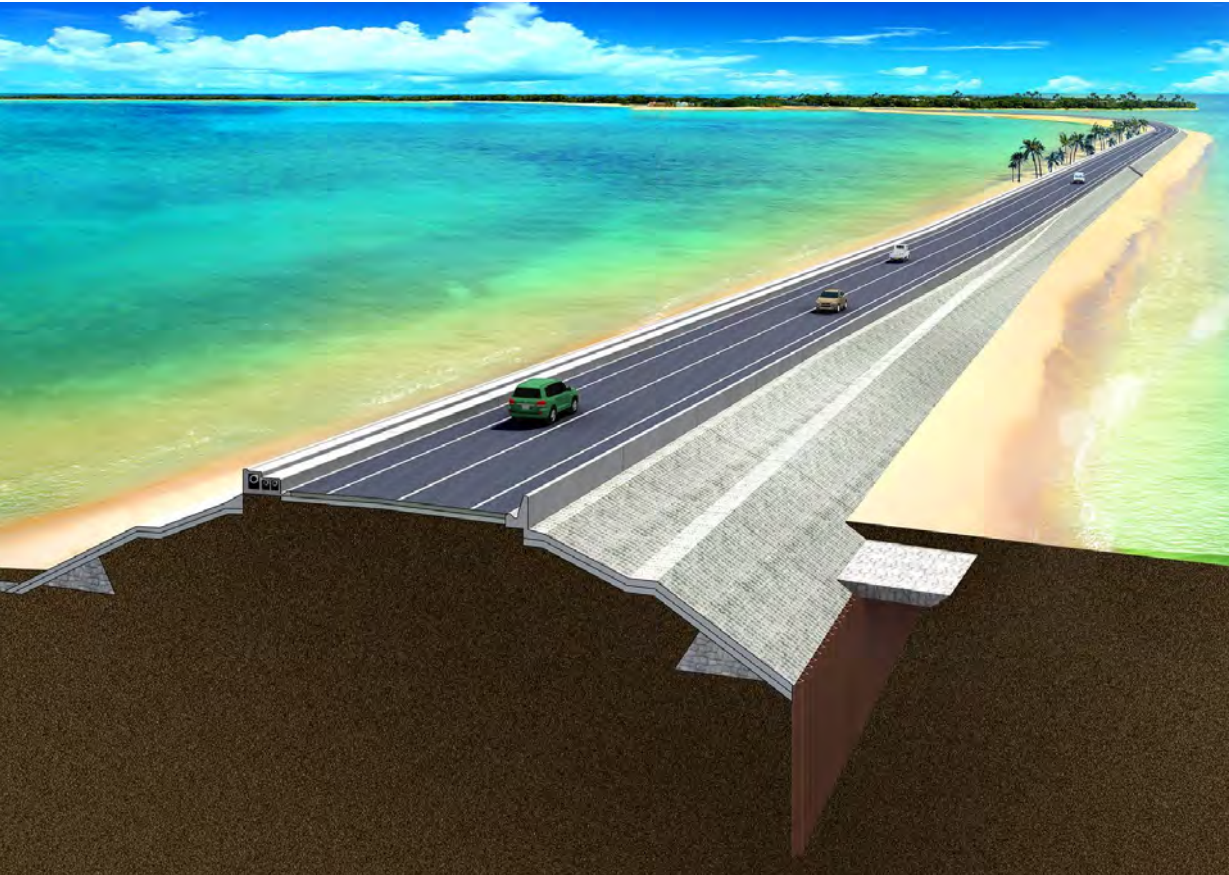


② : Overlay of existing revetment mat



③ : Overlay of existing revetment mat + Foot protection sheet pile

# The Project for Reconstruction of the Nippon Causeway (ODA Grants)



Conceptual drawing



Before renovation



After renovation

## Kyrgyz Republic

---

- CASE 2 :Climate change measures in the road sector
- The Project for Avalanche Protection on Bishkek-Osh Road



# The Project for Avalanche Protection on Bishkek-Osh Road (ODA Grants)

## Project Overview

- A snow shed is planned to be constructed at the 246km point of the BO Road,
- The main trunk road connecting the capital Bishkek and the second largest city Osh, to prevent the frequent occurrence of large-scale avalanches.
- This project developed a snow shed (L=460m) and an approach road (L=550m)

## Damage

- 22 large avalanches occurred in the 46 years between 1968 and 2013.
- The above avalanches caused multiple deaths and long-term road closures, greatly affecting human disasters and the economy.
- The largest avalanche volume in the past was 2,900,000 m<sup>3</sup>.
- The maximum width of snow accumulation on the road was 540 m.
- The maximum height of snow accumulation on the road surface was 42 m.

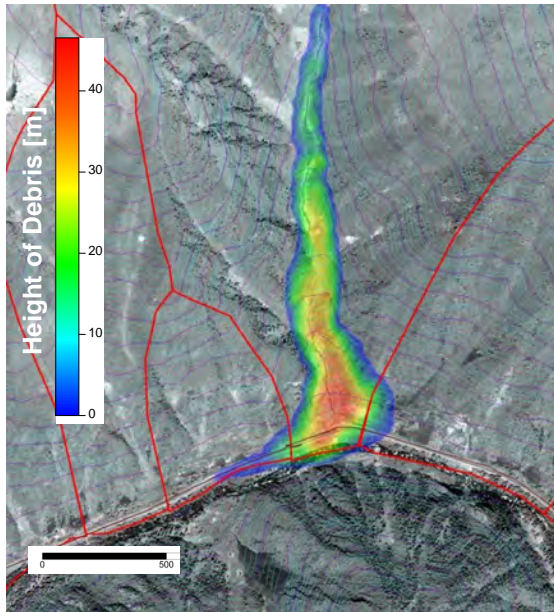


Situation after the avalanche at 246km point on BO Road  
(after snow removal)

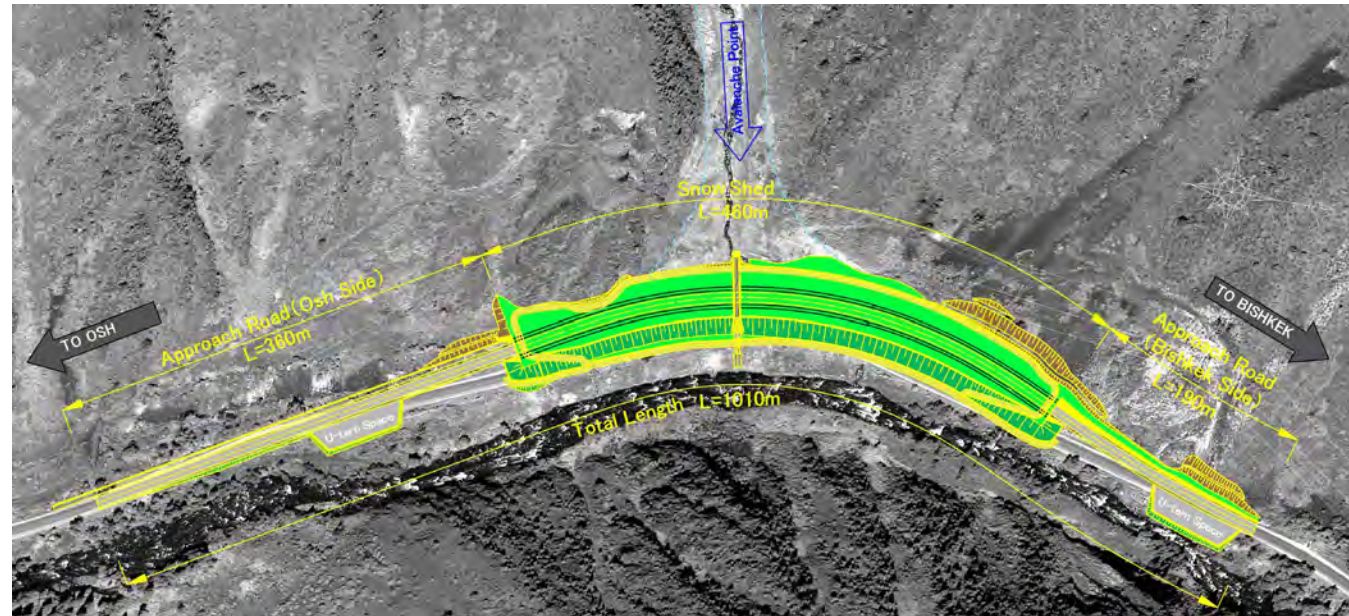
# The Project for Avalanche Protection on Bishkek-Osh Road (ODA Grants)

## Consideration of countermeasures

- Collected records of large avalanches (total of 22) over the 46 years from 1968 to 2013
- The largest avalanche among them was set as the scale of countermeasures for this project
- Based on the local topographical information and snow accumulation information, the speed and range of the avalanche were predicted through analysis using an avalanche simulation, and the planned range of the snow shed was set



Avalanche simulation results  
(Understanding the extent of avalanche impact)



Plan view (snow shed and approach road)



# The Project for Avalanche Protection on Bishkek-Osh Road (ODA Grants)



Conceptual drawing



Snow shed entrance



Inside the snow shed

CASE 3 : Technical Cooperation Project in Japan

Resilient Mountains Road for Landslide Risk Mitigation

# Resilient Mountains Road for Landslide Risk Mitigation Capacity Development Program in Japan

## - Program example in Kanazawa-

	Subjects/Contents	Schedule
Output 1	<ul style="list-style-type: none"><li>■ Lecture and Practice</li><li>• UAV shooting practice at landslide sites</li><li>• Topographic mapping method using Google Earth data and UAV data</li></ul>	3 days
Output 2	<ul style="list-style-type: none"><li>■ Lecture and Exercise</li><li>• Analysis method of features of topography (landslide sites) from topographic maps</li><li>• Analysis method of expected damage prediction from topographic maps</li><li>• Comparison with analysis using satellite image data</li></ul>	3 days
Output 3	<ul style="list-style-type: none"><li>■ Lecture and Exercise</li><li>• Countermeasure planning and design method based on the analysis results in Output 2</li><li>• Countermeasure construction and maintenance management method</li><li>■ Site Visit</li><li>• Landslide sites in Fukui</li></ul>	5 days
Output 4	<ul style="list-style-type: none"><li>■ Action Plan</li></ul>	5 days



Lecture



Site visit

# Resilient Mountains Road for Landslide Risk Mitigation Capacity Development Program in Japan



Surveying practice



Site visit



UAV shooting practice



Countermeasure planning and design



Thank you